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THESIS

A REVIEW OF THE MARINE CORPS MAINTENANCE OF
REAL PROPERTY PROGRAM IN ORDER TO IMPROVE THE
MARINE CORPS' BMAR PROJECTION

by

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June 1980

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20. (continued)

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PROPERTY PROGRAM IN ORDER TO IMPROVE THE
MARINE CORPS' BMAR PROJECTION

by

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requirements for the degree of

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ABSTRACT

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I. INTRODUCTION

A. A HISTORICAL REVIEW OF THE BACKLOG OF MAINTENANCE AND REPAIR IN THE DEPARTMENT OF DEFENSE

Each year the Department of Defense (DOD) budget receives close scrutiny from the public and Congress. Since the early 1960's Congress has become increasingly concerned with the Defense Department's handling of its land and facilities. In a House Appropriations Committee report (H. Rept. No. 1607, 87th Congress, 2nd session), published in 1962, the Committee expressed concern that funds which were authorized for the maintenance of real property (MRP) were being diverted by the military services to other operational requirements. To prohibit this practice Congress, as part of the Fiscal Year (FY) 1963 DOD Appropriations Act, enacted a statutory lower limit or floor on expenditures for the maintenance of real property. Congress has continued the statutory maintenance floor in subsequent appropriation acts [Staats, 1979].

Initially Congress set the maintenance floor at an amount equivalent to the military services' budget request for MRP. Congress continued the procedure from the FY 1964 through the FY 1971 Appropriation Acts. In FY 1972, the Army and the Air Force requested a maintenance floor below their projected expenditures and Congress approved the reduced maintenance floors. The approval provided an opportunity for the

Army and Air Force to divert funds from MRP to other operational requirements. These two military services continued to request and receive the approval of Congress for the reduced maintenance floor in subsequent appropriation acts. In FY 1975 the Navy and the Marine Corps requested similar approval for a reduced maintenance floor. Because of the requests and the continued increases in the backlog of maintenance of real property (BMAR) throughout the DOD, Congress in FY 1975 reinstituted maintenance floors equal to the projected expenditures [Staats, 1979] the military services estimated in their budget requests.

The action taken by Congress failed to halt the growth in BMAR. In an attempt to remedy the situation they authorized additional funds in FY 1978 for MRP with a concurrent increase in the maintenance floor. Congress was determined to check the growth in the BMAR and maintain it at the FY 1977 level of \$1,949.5 million. However, this action failed to stop the growth in BMAR and the FY 1978 BMAR showed an increase of \$233.5 million. In response, Congress directed in the FY 1979 report on the DOD Appropriations Act that the FY 1978 BMAR be established as a baseline [Staats, 1979] which was not to be exceeded. Although each of the military services has instituted a program control system to enable them to comply with Congressional wishes, the BMAR increased to \$2,133 million in FY 1978.

Additionally Congress requested the Comptroller General of the United States to conduct a survey into the military services' MRP programs. The Comptroller General's task was to provide information on factors which have caused the continuing growth in the BMAR. His initial report [Staats, 1979] suggests inflation, fiscal constraints in the budget, the continued deterioration of previously unreported deficiencies, and the increased emphasis to identify the BMAR as factors.

The United States Marine Corps' BMAR has continued to increase despite the additional resources provided for the maintenance and repair of real property. Moreover the Marine Corps has instituted changes to the program control system for the maintenance and repair of real property, but the changes have not been able to stop the growth of the BMAR. Several discrepancies in the Marine Corps activities' execution of the maintenance and repair of real property have been identified in the initial report of the Comptroller General's survey [Staats, 1979] of the military services' MRP programs.

This study will review the Marine Corps' program control system for the maintenance and repair of real property and evaluate the reasons these discrepancies occurred. Additionally this study will review the factors which have been cited as having influenced the growth in BMAR. Once accomplished, recommendations to improve the Marine Corps program control system will be specified. These recommendations are focused

at improving the Marine Corps program control system so that a more positive measure of BMAR can be identified.

B. THE PROBLEM STATEMENT

The United States Marine Corps' BMAR has continued to increase. Although the Marine Corps has increased the MRP resources to halt the increase, a recent survey by the Comptroller General indicated that the Marine Corps' BMAR still does not reflect the total amount of backlog. In light of this information, this study will evaluate the Marine Corps program control system for the maintenance and repair of real property, the method the Marine Corps utilizes to forecast the BMAR, and provide recommended improvements. Once accomplished, the Marine Corps program control system will provide a more positive measure of BMAR.

C. ORGANIZATION OF THE THESIS

Chapter I began with a historical review of BMAR development and identifies the problem being addressed in the study. An overview of the organization of the study and the research method followed. Chapter II delineated the control systems utilized by the military services to manage their respective MRP programs. A detailed analysis of the MRP program which is utilized by Marine Corps activities follows in Chapter III. The problems and deficiencies of the Marine Corps MRP program is presented in Chapter IV. Conclusions and recommendations are presented in Chapter V.

D. RESEARCH METHOD

Two research methods were used, literature review, and data collection through interviews. The literature review was conducted in three phases. First, sources catalogued in the Defense Logistics Studies Information Exchange and the Defense Technical Information Center were examined for studies on the maintenance of real property. Literature dealing with the Maintenance of Real Property was located through a review of the information at the Naval Postgraduate School Dudley Knox Library. Bibliographic sources identified in the selected studies were also obtained. Additional data was obtained through interviews conducted with government personnel concerned with the various military services' maintenance of real property programs.

II. A HISTORICAL PERSPECTIVE OF MRP IN THE DOD

A. BACKGROUND

Despite the actions of Congress and the DOD, the growth in BMAR has continued. Although Congress has granted an increase in the resources to maintain land and facilities from FY 1965 through the present, the backlog of maintenance continues to grow [Staats, 1979]. Mounting criticism from Congress has forced the DOD to take more positive action to correct this problem [Vance, 1964]. This chapter outlines the historical development of the MRP program currently in effect in the DOD.

In FY 1962 the DOD established a Real Property Maintenance Council. Its function was to act as a forum for the exchange of ideas, information, and expertise for managing the MRP program [Staats, 1979]. The Council consisted of the executive managers of MRP from the military services, defense agencies, and the DOD and was responsible to the DOD for monitoring, evaluating, and recommending improvements in the policies and programs for the MRP. Although only advisory in nature, the Council has recommended several improvements to the MRP program which have been implemented by the DOD. Two of the Council's recommended changes that have been accepted by the DOD have improved the guidance on the management of MRP programs. The first change recommended by the Council

was a redefinition of the term BMAR. Currently the term is defined as:

The Backlog of Maintenance and Repair (BMAR) is the end of the fiscal year measurement of maintenance and repair work remaining as a firm requirement of the installation work plans prescribed by the DOD Directive 4165.2 but which lack of resources prohibit accomplishment in that fiscal year.

Although this definition was implemented by the DOD, the definition does not strictly delineate the criteria the maintenance and repair work that should be accomplished, such as:

1. Whether the maintenance and repair is cost effective.
2. Whether the maintenance and repair impacts on the readiness of the unit.
3. Whether the maintenance and repair is required by statute.
4. Whether the maintenance and repair affects the health or safety of the personnel.

The second change was to initiate a program control system to effectively manage the MRP program within DOD. The program control system provided for:

1. The inclusion of the unfinanced backlog of maintenance and repair in the total maintenance requirements for real property.
2. MRP program visibility in the Five Year Defense Plan.
3. Evaluation of MRP program performance by required reports.

The DOD recognized that additional efforts were required at the service level to integrate the MRP input into the Planning, Programming, Budgeting System (PPBS). Therefore, the DOD established a joint military service program and budget committee to review the military services input on MRP and recommend procedures to identify their requirements and priorities [Staats]. The committee recommended, and the DOD implemented, the following changes to the procedures followed by the services [Staats, 1979]:

1. Required the inclusion in each military service's Program Objective Memorandum (POM) submission a meaningful analysis of the components' real property maintenance activity's requirements. The analysis was to include information on the condition of the real property and the probable impact on missions which would result from the planned funding level over the Five Year Defense Plan (FYDP) period.
2. Replace the annual MRP Reports from the components with the budget report submitted by the comptrollers.

B. THE PROGRAM CONTROL SYSTEM IN DOD

1. Guidance

The DOD directed the military services to institute a program control system for the maintenance and repair of real property. The system was to improve the visibility of the MRP program by forecasting the required resources in the military services' POM submission for inclusion in the Five

Year Defense Plan [Staats, 1979]. Resource requirements were to be based upon the military service activities work plans. These plans were required by the DOD guidance to include the military service activities' projections of the maintenance and repair required for their real property holdings for at least the next fiscal year and four additional fiscal years [Staats, 1979]. In addition, the military services were required to constantly monitor the activities' real property maintenance through performance evaluation reports [Staats, 1979]. These reports are required to specify the status of the maintenance program, the resources projected for a project, and the amount of resources used. The DOD guidance, delineated in DOD Directive 4165.2 and 4165.58, did not establish an exact system the services must follow. As a result, each of the military services developed their own program control system for MRP.

2. The United States Army Program Control System

The Army's program control system for the maintenance and repair of real property is administered by the Office of the Chief of Engineers and is detailed in Army Regulation 420-16, dated 27 January, 1977. The Army's definition of the term "BMAR" is similar to that expressed by the Real Property Maintenance Council and is defined as follows:

The end of fiscal year measurement of maintenance and repair work remaining as a firm unconstrained requirement, but which lack of resources prohibited accomplishment in the fiscal year. [Staats, 1979]

The Office of the Chief of Engineers monitors and controls the Army system through two reports required annually from each installation and each major command [Staats, 1979]. The first report, the report on technical data, provides technical information on program costs, performance factors and BMAR. The second report, the report on unconstrained requirements, provides the total resources necessary for the maintenance and repair of real property. This report details the maintenance actually accomplished by the facilities and the BMAR for the installation. It provides the basis for monitoring the MRP and documents the installation's MRP budget request.

Validation of the program control system in the Army is accomplished by the major commands who are held responsible for the maintenance of the real property. These commands are responsible for the validation of BMAR, providing the funds for the MRP program, and issuing implementing instructions for the system. The major commands manage their systems by adherence to the following central guidance [Staats, 1979]:

1. Identify the maintenance and repair requirements.
2. Establish priorities for the work requirements.
3. Provide funding for the work based upon the established priority.
4. Identify the work requirements which were not funded and cite them as their BMAR.

3. The United States Navy Program Control System

The Navy's program control system for the maintenance and repair of real property is administered by the Office of the Chief of Naval Operations and is delineated in Chief of Naval Operations Instruction 11010.23D, dated 15 March 1977, and 11010.34, dated 21 January 1977 [Staats, 1979].

The Navy's definition of the term "BMAR" is more restrictive than the DOD definition. Before a maintenance procedure is placed on the Navy BMAR list, it must be deemed a "non-deferrable" procedure. Formulation of the BMAR report is an iterative process between the activities and the major commands responsible for funding the maintenance and repair of real property.

The process is initiated by the activities' submitting an annual inspection report to their major command. From the inspection report the major command formulates a list containing all unfunded deficiencies. This list is then reviewed by the subordinate activity. Those deficiencies which cannot be deferred beyond the current year, due to operational requirements or economic impact, are forwarded to the major commands. These reports are adjusted for [Staats, 1979]:

- (1) Inflation, the deterioration of the backlog deficiencies and other non-deferrable deficiencies expected to occur between the submission of the activity report on 1 March and the end of the fiscal year, 30 September.
- (2) The estimate of maintenance and repair funds to be applied to the non-deferrable projects listed on the activity's 1 March report and the end of the fiscal year, 30 September.

The major command then validates the reports and summarizes the data for inclusion on their summary report.

The summary report indicates the major command's assessment of the condition of the deficiency and an evaluation of the impact of the deficiency on the activity's mission. Annually, the major command submits their summary report to the Office of the Chief of Naval Operations (CNO). The Office of the Chief of Naval Operations reviews the summary reports, meets with the major commands to evaluate the deficiencies and then establishes goals for the Navy in facility categories determined to require the most attention. Programs are undertaken based on the guidance and funds given by the Office of the Chief of Naval Operations.

4. The United States Air Force Program Control System

The Air Force's program control system for the maintenance and repair of real property is administered by Headquarters United States Air Force and is detailed in Air Force Regulation 86-1, dated 6 August 1976. The Air Force utilizes two methods to accomplish their maintenance of real property [Staats, 1979], their own "in-house" maintenance personnel or contract services from another government agency or civilian contractor. An installation facility board validates the activity's maintenance and repair requirements and determines the method by which the project is to be accomplished.

Once a method is determined the installation submits a monthly status report identifying the projects which are

to be contracted along with the project's current status. If the installation concludes it will not accomplish all the "in-house" projects in the fiscal year, the installations then reclassify the project from "in-house" to contract service. Based upon this procedure the Air Force contends that the definition of "BMAR" cited below correctly identifies all the maintenance and repair deficiencies [Staats, 1979]:

The maintenance and repair projects by contract required in the previous fiscal year but which were deferred at year end due to lack of resources.

The Air Force program control system is based upon the monthly status reports of projects validated for contract service submitted by their installations. These monthly status reports are verified by the major commands in the Air Force chain of command and are utilized by the Air Force to project their BMAR.

5. The United States Marine Corps Program Control System

The Deputy Chief of Staff for Installations and Logistics Office (DCS I&L) is the responsible office in the Marine Corps for administering the program control system for the maintenance and repair of real property. Marine Corps Order P11000.5E, dated 31 May 1979 and P11000.7A, dated 13 November 1975 delineate the control system. The foundation of the control system is an annual inspection of an installation's real property [Commandant of the Marine Corps, 1975]. An inspection report identifying the resources required to accomplish any maintenance and repair necessary is completed for each

item of real property. These reports are consolidated into a plan of the installation's work for the next fiscal year. The installations review their work programs and submit an annual Backlog of Maintenance and Repair Report and Projects Plan to DCS I&L at the end of the fiscal year. Quarterly maintenance performance evaluation reports and an on-site validation of the Backlog of Maintenance and Repair Report and Projects Plan provide an update to DCS I&L in projecting the BMAR. The validation is accomplished by an actual visual inspection by a representative of DCS I&L of each item of real property identified to require repairs greater than \$25,000. Based upon this system the Marine Corps defines "BMAR" as [Commandant of the Marine Corps, 1975]:

The end of the fiscal year measurement of the maintenance and repair work remaining as a firm requirement of shore activity's work plan but the lack of resources prohibit accomplishment during that fiscal year.

C. THE DOD'S METHOD TO REDUCE THE BMAR

The DOD issued guidance on the procedures the military services are to utilize to reduce their BMAR. The guidance, incorporated in DOD Directive 4165.2, effectively requires the military services to establish a five year plan to reduce their BMAR to a manageable level [Staats, 1979]. The resources to accomplish the plan are programmed into the military services' POM submission for identification in the Five Year Defense Plan. Included in the justification for the POM must be an assessment of the condition of real property and

a forecast of the effect of the proposed five year funding level would have on the military service's mission. Although this procedure has been in effect since 1970, to date the BMAR has not been reduced.

The current DOD program follows the procedures expressed above. The military services first identify the resources required to reduce their BMAR in their POM submissions [Staats, 1979]. The resources include the maintenance and repair funds necessary to cover their annual requirements and the funds to reduce the outstanding BMAR in equal increments to a manageable level by Fiscal Year 1984. Excluded from the above target date is the U.S. Army BMAR for Europe which has Fiscal Year 1991 as the target date. However, when the military services' budget requests for Fiscal Year 1980 are compared to the POM projections, the budget requests are substantially lower than the amount required. Table I shows the difference between the POM projections and the military services' budget requests and the respective BMAR projections as forecasted by the DOD. The disparity in the BMAR projections when adjusted for the difference in funding can be attributed to the effect of inflation, the continued deterioration of deferred repairs, and the efficiency of the maintenance services performed by the respective military services.

TABLE 1

FISCAL YEAR 1980 POM VERSUS BUDGET COMPARISON ESTIMATE

	<u>POM</u>		<u>Budget Request</u>	
	<u>Funding</u>	<u>End of year Backlog</u>	<u>Funding</u>	<u>End of year Backlog</u>
	<i>millions</i>			
Army	\$675.0	\$1,050.0	\$448.2	\$1245.2
Navy	\$497.4	475.0	420.5	525.0
Air Force	\$681.0	266.0	666.3	400.4
Marine Corps	<u>\$136.0</u>	<u>94.0</u>	<u>102.5</u>	<u>143.6</u>
TOTAL	<u>\$1,989.4</u>	<u>\$1,885.0</u>	<u>\$1,637.5</u>	<u>\$2,314.2</u>

[Staats, 1979]

The military services claim the reason for the difference is that the budget targets established by the Office of Management and Budget prevent them from requesting the funds indicated in the POM submissions [Staats, 1979]. Unless the military services are provided additional funds by Congress or are able to reprogram funds for the maintenance and repair of real property, the BMAR will continue to increase.

Another disparity in the interpretation of the DOD guidance is the military services' varied definitions of the term "manageable level of BMAR." The DOD guidance [Staats, 1979] specifies that the military services are to program through their POM submissions the reduction of BMAR to a "manageable level" by 1984. Each of the military services interprets

the term "manageable level" differently, as illustrated below [Staats, 1979]:

1. Army--established the manageable backlog at 20 percent of its annual recurring maintenance requirements which they define as the day to day cyclic performance of work required to prevent incipient failures and to preserve and prevent deterioration of a facility.
2. Navy--established the manageable backlog level at zero.
3. Air Force--established the manageable backlog level as the lead time (6 to 9 months) required of their personnel to design and award a contract, estimated to be between sixty and one hundred million dollars.
4. Marine Corps--established the manageable backlog as one-half of one percent of the current plant value of the activity.

The projected POM Fiscal Year 1984 manageable level of backlog forecasted by the military services is shown in Table 2.

TABLE 2
END OF THE YEAR BACKLOG

	<u>Actual 1979</u>	<u>POM Level 1984</u>
	- - - <i>millions</i> - - - - -	
Army	\$1179.0	\$594.0
Navy	563.0	0.0
Air Force	365.5	42.0
Marine Corps	<u>133.1</u>	<u>100.0</u>
TOTAL	\$2240.6	\$736.0

[Staats, 1979]

The different interpretations cause the amount projected as manageable level of backlog to vary as indicated by the Navy's manageable backlog level of \$0.0 and the Army's manageable backlog level of \$594.0.

D. THE TREND OF GROWTH IN BMAR

Between 1965 and 1979, the BMAR has increased from \$285 million to \$2,241 million. The BMAR in FY 1979 [Staats, 1979] was 7.86 times what it was in FY 1965. Table 3 provides a breakdown by military service of the planned expenditures, maintenance floor, actual expenditures, and backlog from FY 1965 to the present.

Table 3 brings to focus individual military service trends. The Army experienced the largest increase in BMAR, \$1098 million, which is a 1456 percent growth in BMAR. They also incurred the largest single year increase, \$486 million in Fiscal Year 1977, which they indicate resulted from their efforts in that year to identify and validate the backlog reported by the installations. The Navy realized a \$427 million increase in the backlog over the FY 1965-1979 period, a 414 percent growth. Of special interest was the \$144 million reduction in Fiscal Year 1977 experienced by the Navy. The dramatic drop resulted from their altering the definition of the term "BMAR" to reporting only deficiencies which should not be deferred. The Marine Corps had the smallest BMAR during the period but also incurred the largest percent

TABLE 3
SUMMARY DATA
ON MAINTENANCE OF REAL PROPERTY
FACILITIES (OPERATION AND MAINTENANCE APPROPRIATION)
[Stats, 1979]

	FISCAL YEAR															
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979*	1980**
Army:																
Planned expenditures	\$236.0	\$221.9	\$259.8	\$280.0	\$280.0	\$225.4	\$220.0	\$258.0	\$325.8	\$308.4	\$414.7	\$446.3	\$532.4	\$527.2	\$573.1	\$510.8
Maintenance floor	236.0	225.0	264.3	280.0	280.0	225.0	220.0	240.0	231.0	246.0	334.5	400.0	480.0	490.0	580.2	457.1
Actual expenditures	261.8	273.7	326.3	389.2	359.5	351.2	308.5	376.1	367.5	382.2	422.5	413.2	565.0	592.0	614.2	-
Backlog	81.0	63.0	81.0	208.0	232.0	268.1	226.5	222.6	299.3	411.3	538.3	696.8	1,154.5	1,241.2	1,173.0	1,245.2
Navy:																
Planned expenditures	133.7	141.0	142.7	154.0	155.6	147.5	126.9	124.7	135.5	138.2	274.5	222.8	258.7	291.6	378.4	446.6
Maintenance floor	133.7	141.0	142.7	154.0	155.6	147.5	126.9	124.7	127.0	138.2	221.3	200.0	243.0	275.0	380.3	386.1
Actual expenditures	150.4	157.0	144.2	152.4	166.9	172.0	152.6	155.8	172.5	200.7	272.6	264.1	296.6	368.1	405.0	-
Backlog	136.0	145.0	155.0	204.5	257.8	280.0	324.0	345.0	387.5	400.0	460.0	630.0	486.0	536.0	563.0	525.0
Marine Corps:																
Planned expenditures	19.0	20.5	20.5	22.2	22.7	22.4	31.0	37.3	38.0	44.5	51.9	59.2	82.5	88.8	113.9	106.1
Maintenance floor	19.3	20.5	20.5	22.2	22.7	22.4	31.0	37.3	37.5	44.5	50.0	55.0	74.0	86.7	107.5	98.0
Actual expenditures	20.6	21.2	21.6	22.6	23.4	24.4	39.3	44.0	44.4	56.1	56.8	67.9	88.1	97.8	118.4	-
Backlog	8.0	6.0	7.0	5.0	6.0	3.4	14.9	19.7	43.6	40.5	65.0	77.3	89.9	105.9	133.1	143.6
Air Force:																
Planned expenditures	230.0	258.0	250.0	250.0	250.0	250.0	250.0	276.0	265.1	288.1	356.8	394.5	423.4	547.9	635.3	709.6
Maintenance floor	230.0	258.0	250.0	250.0	250.0	250.0	250.0	250.0	216.7	215.0	330.0	340.0	380.0	509.0	592.2	654.8
Actual expenditures	289.5	264.5	289.6	280.4	296.0	315.3	312.7	334.1	374.3	439.3	493.5	535.0	682.8	697.9	660.2	-
Backlog	60.5	112.0	125.0	139.0	158.2	170.3	92.1	82.0	179.3	159.3	150.3	162.0	219.1	299.9	365.5	400.4
Total:																
Planned expenditures	618.7	641.4	673.0	706.2	708.3	645.3	627.9	696.0	764.4	779.2	1,097.9	1,122.8	1,297.0	1,455.5	1,705.7	1,773.1
Maintenance floor	619.0	644.5	677.5	706.2	708.3	644.9	627.9	652.0	612.2	643.7	935.8	995.0	1,177.0	1,360.7	1,660.2	1,596.0
Actual expenditures	722.3	716.4	781.7	844.6	845.8	862.9	813.1	910.0	958.7	1,078.3	1,245.4	1,280.1	1,632.5	1,754.8	1,797.5	-
Backlog	285.0	326.0	368.0	556.5	654.0	721.8	657.5	669.3	909.7	1,011.1	1,213.6	1,566.1	1,949.5	2,183.0	2,240.6	2,314.2

*Figures are updated with current information.

**Backlog for fiscal year 1980 is estimated.

Source: Planned expenditures are the estimated obligations in DOD exhibits supporting the original budget requests for real property maintenance for each fiscal year. Other data obtained from DOD reports dated May 1973 and January 1978 and fiscal year 1980 budget exhibits.

of growth, 1663, from \$3.4 million in Fiscal Year 1965 to \$133.1 million in Fiscal Year 1979. This can be attributed to the age of the Marine Corps' real property and the increased emphasis the Marine Corps is placing on the maintenance and repair of its real property.

Although actual expenditures for maintenance and repair of real property have exceeded the statutory maintenance floor by an average of \$333 million a year from Fiscal Year 1970 through Fiscal Year 1979, the BMAR has continued to rise. The services cite several factors for the growth in BMAR [Staats, 1979]:

1. Fiscal constraints in the budget in light of the priority of competing programs.
2. The growth of inflation.
3. An increase in the emphasis to identify the backlog.
4. Continued deterioration of previously identified deficiencies not corrected.
5. The DOD's redefinition of the term "BMAR."

III. THE MARINE CORPS REAL PROPERTY MAINTENANANCE (RPM) PROGRAM

The Marine Corps Real Property Maintenance (RPM) Program is based upon an annual inspection of each line item depicted on the activity's real property inventory [Commandant of the Marine Corps, 1975]. The inspection is accomplished by trained personnel assigned to the inspection division of the units' maintenance department. A report of this inspection is completed during the inspection using the NAVFAC 9-11014/38 Inspector's Report form. Appendix A provides an example of the form. The report details a rough cost estimate of the work to correct each deficiency. Deficiencies which require repair in the current fiscal year are noted on the inspection report. A job order continuation sheet is attached to the inspection report. The continuation sheet contains a diagram or sketch of the deficiency, the scope of the work required, and additional data essential for planning and estimating the job. Deferrable deficiencies, those that will require maintenance or repair in forthcoming fiscal years, are also cited on the inspection report. These deferrable deficiencies provide input for the activity's Long Range Maintenance Plan.

Each Marine Corps activity responsible for RPM is required to establish and maintain a Long Range Maintenance Plan (LRMP) [Commandant of the Marine Corps, 1975]. The LRMP provides a forecast of the work required to maintain each facility at

the optimum maintenance standard. The maintenance standards established by the Department of Defense upon which the Marine Corps standards are determined are [Commandant of the Marine Corps, 1975]:

- a. Facilities to be used for more than 10 years shall be maintained, as necessary, to preserve the asset and to ensure their most economical and efficient usefulness for an indefinite period.
- b. Facilities to be used from 3 to 10 years shall be given maintenance consistent with the projected useful life of the structures or programs to which they are related.
- c. Facilities to be used for less than 3 years or only to meet a temporary demand shall be maintained to the minimum standard without jeopardizing the health and safety of personnel or seriously impairing the accomplishment of the mission.
- d. Inactive facilities included in mobilization plans shall be maintained to the extent necessary to assure weather-tightness, structural soundness, and protections against fire and erosion, and to permit reactivation in the period prescribed.
- e. Maintenance shall be programmed to permit orderly and economical accomplishment. Recurrent work shall be scheduled on a cyclic basis. Replacement materials which are more durable and provide longer life may be substituted for original materials, provided the economic justifications are sufficient to warrant the increased cost.
- f. To the extent that maintenance falls short of the foregoing established standards, a list of those projects which must be backlogged shall be maintained in sufficient detail to clearly reflect the characteristics of the item and estimated cost of accomplishment.
- g. All operation, maintenance, repair, testing, and inspection of utilities systems will be in accordance with appropriate national codes. In the case of pollution abatement, state and local criteria will be applicable when such are more stringent than the national criteria.

The NAVFACENGCOM, the Navy command responsible for supervision of the Navy RPM Program, publish the maintenance standards by

type of facility utilized by Marine Corps activities. These maintenance standards are delineated in NAVFAC MO-322, Inspection for Maintenance of Public Works and Public Utilities Volume 1, part E. Supplemental maintenance standards according to individual type of facility are detailed in volumes 2 through 4, the Inspection Guides.

The LRMP is a five year forecast of the maintenance plan for the activity. The LRMP provides the strategic plan [Commandant of the Marine Corps, 1975] for the activity's RPM program and is incorporated into the DOD Five Year Defense Plan for maintenance. It begins with the budget year and provides an estimated annual cost for each of the years forecasted. The plan is utilized in developing the sequence of the annual inspection of facilities and provides the inspectors with a history of each facility's deficiencies. It lists each of the line items from the activity's real property inventory as to type of deficiency and cost per fiscal year. Deficiencies cited on the inspectors report which are deferred due to lack of resources are programmed for correction in the budget year of the LRMP. These deficiencies provide justification for the activity's budget submission and are utilized in completion of the annual Backlog of Maintenance and Repair (BMAR) Report and Projects Plan.

The LRMP is the document the maintenance department utilizes to project the Annual and Quarterly Work Programs. The Annual Work Program (AWP) [Commandant of the Marine Corps, 1975]

reflects the specific selection of work the activity projects for the fiscal year and is taken from the deficiencies cited in the budget year of the LRMP. In addition the AWP details the anticipated requirements for continual maintenance, other engineering support and minor construction that can be accomplished with anticipated resources. The AWP is further divided into Quarterly Work Programs. These programs take into consideration such parameters as the seasonal conditions, the timely provision of material requirements, the adequacy of funds and work forces, and the command's priority of project accomplishment [Commandant of the Marine Corps, 1975]. The Quarterly Work Program serves as a basic parameter for the planning, estimating and scheduling of individual jobs for the activity and provides a performance evaluation of the maintenance programs. The performance evaluation is accomplished by the activity's maintenance department through effectiveness rating reports.

All activities performing real property maintenance are required by the DOD to report the effectiveness of their maintenance programs [Staats, 1979]. The activities are required to submit their reports quarterly to DCS I&L. These effectiveness rating reports provide detailed information on the planned versus actual performance of the activity's RPM program. The basis of the planned RPM program for the effectiveness reports is the Quarterly Work Program. Information on the programs' effectiveness, inspection effectiveness,

emergency work order volume, service work volume, work center backlog, production man-hour performance, labor and material performance and accuracy of reported backlog of maintenance and control are delineated in the report [Commandant of the Marine Corps, 1975]. A copy of the reports with instructions for completion are detailed in Marine Corps Order P11000.7A.

A Facility History File is established for each facility listed on the activity's real property inventory listing [Commandant of the Marine Corps, 1975]. This file provides a history of the work performed or scheduled to be performed on each facility. Documents included in the file are [Commandant of the Marine Corps, 1975]:

- a. Inventory Card. A copy of the real property inventory record card prescribed by the current edition of NAVFAC P-78, Real Property Inventory Instructions for Preparation and Distribution of Property Record Cards. Detailed information (number of roof squares, number and sizes of windows) may be listed on the reverse side of the card.
- b. Job Orders and Service Contracts. A copy or microfilm record of each job order or contract for construction repair, or maintenance of the facility. These records may be replaced with subsequent authorizations for similar work.
- c. Inspector's Reports. Reports completed for maintenance and repair revealed during the most recent control inspections.
- d. Emergency/Service Tickets. A separate history file for each facility is maintained to compile emergency and service tickets. A periodic review of these files should be conducted to determine the frequency of similar jobs for possible major deficiencies or causes of abnormally high costs. The files may be cleared of emergency/service tickets annually.

The file provides information necessary to program the major repair projects based on the history of maintenance work

accomplished on the facility and the facility standards established by NAVFACENGCOM.

The basis for the Marine Corps' annual BMAR report to the Department of the Navy and subsequently to Congress is provided by the activity's Backlog of Maintenance and Repair Report and Projects Plan (Report Symbol DD-11014-01). This report is the end of fiscal year measurement of the maintenance and repair work that remained as a firm requirement of the activity's work plan but lack of resources prohibited accomplishing during that fiscal year [Marine Corps Commandant, 1979]. The BMAR items which are listed on the report by the activities are identified by deficiency codes. The deficiencies cited as line items in the report consist of maintenance, repair, and demolition requirements. Coding criteria for the cited deficiencies are [Marine Corps Commandant, 1979]:

a. Code 1, Maintenance and Minor Repair Work. Consists of all maintenance items and all repair items estimated to cost \$25,000 or less per facility. These are facilities deficiencies which should have been corrected during the fiscal year with locally budgeted (Subfunctional Category M-1) funds but were not because of lack of resources. When a facility requires construction work as well as maintenance and repair, only the maintenance and repair portion will be rendered.

b. Code 2, Major Repair Work. Consists of repair items estimated to cost over \$25,000 per facility. After validation, all BMAR Code 2 items will be considered for inclusion in the current or future year facilities projects program; and they need not be listed in the projects plan. When a facility requires construction work as well as major repair work, only the major repair portion will be reported.

c. Code 3, Demolition. Consists of those items of demolition of excess facilities (class 2 real property), regardless of cost. The estimated cost of a demolition item should include the cost of work to restore the site to a condition equivalent to the surroundings. This category applies only to excess facilities, but does not apply to demolition required because of construction or repair. Demolition shall be accomplished as prescribed in MCO P11000.15.

The required format and detailed instructions for this report are provided in Appendix B.

The BMAR Report and Projects Plan also requires that activities submit projects included in their annual plans for the current year and forthcoming year of Code 2 and 3 deficiencies [Marine Corps Commandant, 1979]. These projects are submitted along with the BMAR report and are submitted to the DCS I&L annually not later than 10 October.

Each activity's BMAR Report and Projects Plan is reviewed for Code 2 and 3 deficiencies by the DCS I&L upon receipt. Once reviewed, an on-site inspection to validate these deficiencies is scheduled for each activity [Commandant of the Marine Corps, 1975]. The validation is normally accomplished within sixty days of the report submission with at least one staff representative from the responsible office and representative from the activity. All Code 2 and 3 deficiencies cited on the BMAR Report and Project Plan are inspected. The validation program provides the staff representatives from the DCS I&L with first hand information of the projects requiring work. It allows them to establish a uniform system of determining the optimum solution to the deficiencies and provides for the

establishment of a prioritization of the activity's projects. The prioritizing of the projects is done by the staff representative from the DCS I&L with input provided by activity personnel. The input is determined by rating each project on each of five criteria. The criteria take into consideration such factors as [Commandant of the Marine Corps, 1975]:

- a. The time the project has been delinquent or should be considered for a future program.
- b. The relative influence of the work on the mission of the activity rather than the overall importance of the facility to the mission. This is an expression of the mission relationship rather than the severity of the facility condition.
- c. The expected rate of deterioration of the facility if the deficiency is not corrected.
- d. The severity of the facility's condition or the level of command interest for imponderables (e.g., habitability, pollution abatement).
- e. The deficiency is such that continued deferment may result in higher maintenance costs (e.g., deferral of repiping a building may result in repetitive maintenance work) or, if accomplished at a particular time or under particular circumstances may result in lower costs (e.g., resurfacing a parking lot in conjunction with repairing a street).

Appendix C provides the detailed rating factors and the validation form used for each project validation process. The ratings of each activity are then reviewed by the DCS I&L office to insure that approval/funding for the most critical projects are accomplished first. The DCS I&L determines the level to which projects will be funded and all projects equal to that level or which exceed it are then scheduled for accomplishment. Activities are then notified of the level and are requested

to prepare the project documentation. Instructions for completion of the Project Plans are cited in MCO P11000.5E.

Representatives from the DCS I&L accomplish an annual survey of the activity's real property in addition to the validation program. This survey is distinct from the validation program in that it is designed to be used as a management review of the maintenance operation [Commandant of the Marine Corps, 1975]. The surveys are accomplished to allow for an insight into the use of the prescribed management techniques, to note activity requirements (Code 1), and to observe problems and suggest solutions. The knowledge gained in these surveys allow for an interchange of ideas and solutions to solve similar problems at other activities. The surveys are required to encompass a review of the following [Commandant of the Marine Corps, 1975]:

- a. Maintenance management reports.
- b. Long-range maintenance plan and annual and quarterly work programs.
- c. Annual Inspection Reports in relation to the budget estimates.
- d. Maintenance emergency/service tickets, work requests, and job orders in relation to EPS utilization and accuracy of application of functional category codes.
- e. Workflow and staffing patterns.
- g. General inspection of the physical condition of activity facilities.

The findings which result from the inspection are provided to the command. Findings which cannot be resolved or unusual achievements are covered by a special report.

Each activity's MRP program functions as has been described in this chapter. The physical performance of the maintenance and repairs are accomplished in accordance with the Real Property Facilities Manual, Volume III, Facilities Maintenance Management. Maintenance and repair requirements not accomplished in the annual program due to resource requirements are then cited as BMAR and reported to the DCS I&L. The DCS I&L utilizes the annual BMAR Report and Project Report to establish the amount of BMAR for the Marine Corps. Reasons for the amount of BMAR are then easily documented for the CNO and Congress if required by the DCS I&L based upon the knowledge gained during the annual validation and survey visits.

Maintenance and repair of real property is accomplished at each Marine Corps activity in accordance with the procedures cited in this Chapter. Maintenance and repair work which exceed the activity's "in-house" maintenance capability or are required by Marine Corps or NAVFACENGCOM guidance is performed through contract services [Miles, 1977]. Contract services are the maintenance, repair, and minor construction work performed by contract, inter-service support agreement, or work request by civilian contractors and other government agencies. The Maintenance Officer determines whether the work will be performed by the maintenance department or contract services based upon the Annual Work Plan. The work which the Maintenance Officer decides cannot be accomplished

by the activity's maintenance department due to resource availability or Marine Corps and NAVFACENGCOM guidelines are slated for contract services. Once the work has been determined to be accomplished by contract, the maintenance department notifies the activity's public works department of the contract requirement. The public works department utilizes the input of the maintenance department and assumes responsibility for ensuring the contract work is performed within the applicable Marine Corps and NAVFACENGCOM guidelines.

IV. PROBLEM DISCUSSION

A. MARINE CORPS MAINTENANCE OF REAL PROPERTY PROGRAM AUDIT FINDINGS

Recent audits of several Marine Corps activities' MRP programs by the Naval Audit Service identified discrepancies in the activities' compliance with the Marine Corps' guidance. Findings varied from activity to activity and the impact of the discrepancies on the individual MRP program ranged from minor to severe. Generally, the activities' program satisfactorily accomplished the maintenance and repair of their real property. Only a few similar discrepancies were found to exist at more than one activity [Anderson, 1977; Hooper, 1979; Luke, 1979; and Schneider, 1979]. A discussion of the findings relevant to this study follow.

Improper staffing of billets in the divisions in the maintenance department caused several discrepancies. The staffing of the maintenance department with personnel of a wage grade exceeding the one necessary [Schneider, 1979] thereby resulting in excessive personnel costs was one discrepancy. Several activities assigned "over-qualified" personnel to billets which could have been filled by personnel of less expertise and salary. The staffing of the maintenance department billets with personnel of the proper wage grade would reduce personnel costs in the maintenance department.

A second discrepancy associated with improper staffing was noted at two activities where maintenance personnel performed work which was not within the division's responsibility [Anderson, 1977]. An example would be personnel assigned to the emergency/services division who perform recurring maintenance work. When this procedure is allowed to occur, it culminates in delays/deferrals in the division's normal work which subsequently results in an increased backlog of work. The activity must ensure each division perform the duties for which they are responsible prior to performing work outside their area of responsibility. Divisions which have an excessive backlog of work are authorized to utilize temporary personnel or may "contract-out" the necessary services as specified in the Marine Corps directives [Commandant of the Marine Corps, 1975].

A third discrepancy was found in the control of materials for maintenance and repair projects. Several audits revealed situations where materials were not being adequately safeguarded [Hooper, 1979]. More than one factor influenced this discrepancy. The "pre-positioning" of materials for scheduled maintenance work increased the amount of materials on-hand as delays occurred in the maintenance program. Material build-up caused additional storage requirements which normally was not available. Storage shortages forced the maintenance department to stash the materials in places which did not provide the adequate security, atmosphere, or other

special storage considerations for the materials [Schneider, 1979]. Program delays also were shown in some activities to cause a "snowballing" effect on increasing the backlog [Schneider, 1979]. The "snowballing" effect results from delays in the maintenance and repair of real property which causes more direct labor to be expended on work than the standard. The increased direct labor resulted from three factors [Schneider, 1979]:

1. Delayed scheduled jobs may have to be accomplished piecemeal using additional resources to restart the job when personnel are pulled off the job for higher priority work.
2. Facilities may deteriorate further while awaiting maintenance work.
3. Delays by a work center with a large backlog may impede the work of another work center whose effort follows that of the first work center.

The fourth area in which discrepancies were found was in the training of maintenance department personnel [Luke, 1979, and Schneider, 1979]. Not the training of the personnel who actually perform the physical maintenance of the work per se, but the training of the personnel who inspect, estimate, and administer the MRP program. Identifying facility deficiencies and programming the work required to correct them are fundamental to the execution of a MRP program. In order to ensure an accurate and uniform system of identifying facility

deficiencies based on standards is accomplished, inspectors and planners and estimators require recurrent training. The training develops more proficient personnel, provides improved morale, and ultimately results in a more effective program. But inspectors and planners and estimators are not the only people who require training. Personnel involved in administering the program, such as those who schedule the continuous inspection program or those who complete the maintenance reports, also require training. Management personnel in the maintenance program need to insure that administrative personnel in the operations division are knowledgeable of the most recent Marine Corps guidance and adhere to the program requirements. Attention to the training of administrative personnel in the operations division of the maintenance department provides a more effective maintenance program, improved personnel morale, increased facility deficiency identification and a resultant improved projection of the activity's maintenance and repair requirements [Schneider, 1979]..

The auditor's recommendations included an emphasis to consider "contracting out" of maintenance and repair projects to commercial contractors as a viable method of accomplishing the maintenance and repair of real property [Anderson, 1977]. The auditors did not consider "contracting out" of maintenance and repair projects as a panacea for reducing the backlog. Judicious use of "contracting out" for maintenance services

on work identified in the AWP which cannot be accomplished by "in-house" sources can reduce the backlog. This procedure is especially significant in light of the government policy, established by Office of Management and Budget (OMB) Circular A-76, to accomplish services through commercial contract.

B. DISCUSSION OF THE MARINE CORPS PROGRAM CONTROL SYSTEM FOR THE MAINTENANCE AND REPAIR OF REAL PROPERTY

The Marine Corps Program Control System for the maintenance and repair of real property is unique in the DOD. It is the only military service in which the DCS I&L conducts an annual on-site validation of each activity responsible for the maintenance of real property [Commandant of the Marine Corps, 1975]. This on-site validation encompasses a physical inspection of all Code 2 and 3 projects for a determination of a rating. Funding of repair projects to correct the Code 2 and 3 deficiencies is accomplished for the highest rated projects in the Marine Corps subject to funds availability. Since the DCS I&L in conjunction with the activity personnel determine the numerical rating of the projects, the system is not influenced by major or intermediate command bias. The Marine Corps system is the most equitable of the services in the DOD because the projects which require maintenance the most are accomplished first.

Pivotal to the Marine Corps' program control system is the annual inspection of each item of real property by a

qualified inspector [Commandant of the Marine Corps, 1975]. It is essential that the inspector be knowledgeable and school-trained on the maintenance standards published by the Naval Facilities Engineering Command. Unless the inspector performs a thorough inspection on each item of real property, the program control system cannot identify the maintenance and repair requirements. The inspector must utilize all available information to accomplish the optimum inspection. Included in the inspection should be a review of the Facility History File, to include the most recent inspection report and the maintenance and repair projects that had previously been performed on the facility. Additionally it is beneficial for the inspector to contact the tenant for input of possible deficiencies. Only if the inspector reviews all the available information and is accorded adequate time to perform a thorough inspection, the inspector is not rushed due to time constraints or quotas, is the system capable of providing the optimum results.

In addition to the annual on-site validation, the DCS I&L conducts a separate annual survey of each activity's maintenance program [Commandant of the Marine Corps, 1975]. The survey of the maintenance program is conducted to insure that it meets the guidelines established by Marine Corps directives. Although the survey is oriented toward a management review of the program, it does entail a review of the activity's Code 1 maintenance requirements in addition to an inspection

of the physical condition of the facilities, maintenance management reports, LRMP, AWP, Quarterly Work Programs, inspection reports, budget estimates and the actual workflow of the program. The DCS I&L personnel are then able to provide an interchange of ideas and solutions to similar activities.

The activity's maintenance program is based upon the annual inspection of its facilities. Based upon the inspection reports the activity develops a LRMP. The budget year of the LRMP establishes the basis for the projection of the activity's AWP [Commandant of the Marine Corps, 1975]. Subsequently, based upon seasonal requirements, the activity develops its Quarterly Work Plan from the AWP. The success of the activity's program is based upon two factors: the annual facility inspection and the AWP. Unless a valid projection of work is identified by the activity from a thorough annual inspection program, problems will prohibit the successful projection of the AWP. If the optimum inspection is accomplished and the AWP is efficiently programmed the activity can then determine the amount of work it is capable of performing "in-house" and, based upon the availability of funds, schedule the extra for contract services.

C. FACTORS WHICH HAVE CAUSED THE INCREASE IN BMAR

1. General

In spite of the stringent program control system for the maintenance and repair of real property the Marine Corps

utilizes, the Marine Corps BMAR continues to grow. Several factors have been identified by the DOD and the services as having influenced the continued growth in BMAR. These factors were noted in Chapter II. In this section the impact each of the factors had on the growth of the BMAR in the Marine Corps is evaluated.

2. Inflation

Inflation was cited as attributing a portion of the increase in the BMAR for the services [Staats, 1979]; therefore, a constant dollar comparison on the growth of the Marine Corps backlog and expenditures on the maintenance and repair of real property is provided in Table 4. The DOD deflators applicable to real property maintenance and repair were utilized to convert the backlog and actual expenditures into constant FY 1980 dollars. Table 5 provides a similar comparison for the DOD. Although the DOD actual expenditures in constant dollars has shown a decrease for the period of FY 1965-FY 1979, the Marine Corps' actual expenditures has increased. Tables 4 and 5 also demonstrate an overall real increase in the backlog since the early FY 1970's for both the DOD and the Marine Corps.

3. The Increased Emphasis to Identify the BMAR

Congressional criticism has influenced the DOD to place more emphasis on the maintenance and repair of real property [Staats, 1979]. In light of this criticism, the Marine Corps revised their program control system for the

TABLE 4
GRAPHIC CONSTANT FISCAL YEAR 1980 DOLLARS COMPARISON OF EXPENDITURES
AND BACKLOG MAINTENANCE AND REPAIR-FISCAL YEARS 1965 - 1979
MARINE CORPS

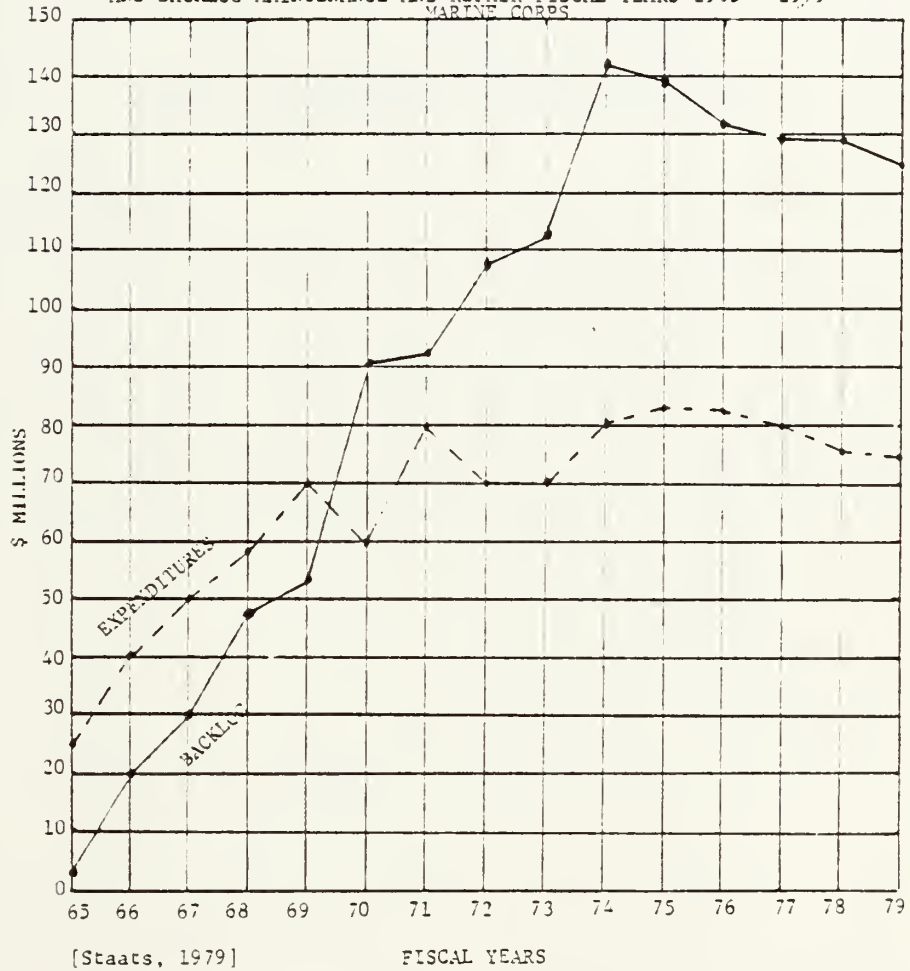
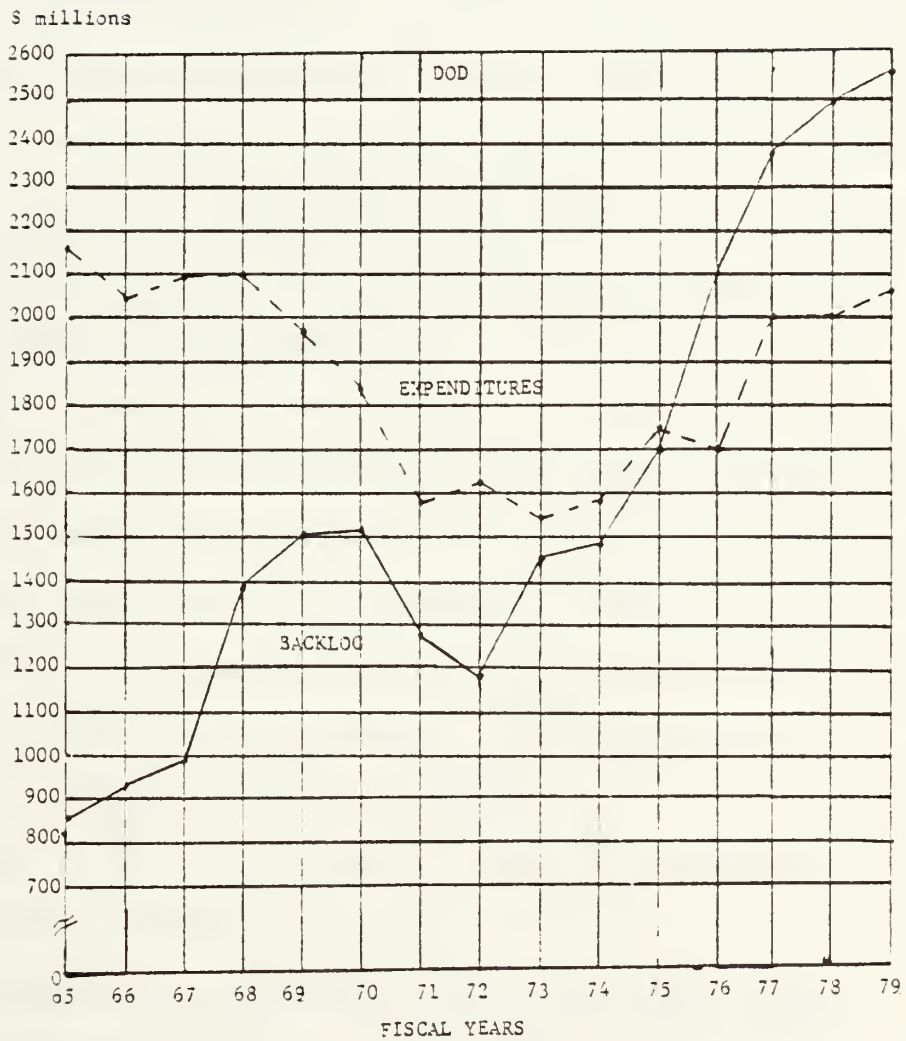


TABLE 5
 GRAPHIC CONSTANT FISCAL YEAR 1980 DOLLARS
 COMPARISON OF EXPENDITURES AND BACKLOG OF MAINTENANCE
 AND REPAIR - FISCAL YEARS 1965 -1979



maintenance and repair of real property [Staats, 1979]. The Marine Corps identifies in their POM submission the resources needed for MRP for inclusion in the Five Year Defense Plan. The DCS I&L for MRP funds in the Marine Corps conducts an annual validation of all repair projects estimated to cost over \$25,000 in addition to conducting an annual survey of each activity's maintenance program. This process has resulted in an identification of a consistent increase in real property requiring maintenance and repair. Table 3 reflected the increase in resources the Marine Corps projected for and expended to correct the maintenance and repair deficiencies.

4. Continued Deterioration of Deficiencies Previously Identified but Uncorrected

The third problem identified as a cause of growth in BMAR is the continued deterioration of the deficiencies which were previously identified but were not corrected [Staats, 1979]. As the time from identification of the deficiency to repair increases, the possibility of the deficiency becoming more costly to repair also increases. An example of such a deficiency is a leaking ceiling. Although this deterioration factor is known to exist, its exact impact on the BMAR growth was not determined during this study.

5. The Impact of the Redefinition of the Term "BMAR"

The redefinition of the term "BMAR" by the DOD also was identified as a factor which influenced the growth of BMAR [Staats, 1979]. The change from the previous definition

of [Staats, 1979]:

Those items of maintenance and repair as defined in the DOD Directive 7040.2 over \$10,000 which cannot be accomplished during the current fiscal year due to lack of resources. An item is considered essential when delay for inclusion in a future program will impair the military readiness and capability, or will cause significant deterioration of real property facilities,

to the current definition of [Staats, 1979]:

The Backlog of Maintenance and Repair (BMAR) is the end of fiscal year measurement of maintenance and repair work remaining as a firm requirement of the installation work plans prescribed by the DOD Directive 4165.2 but which lack of resources prohibit accomplishment in that fiscal year,

in FY 1974 resulted in a more specific definition of the term. The redefinition of BMAR included all of the maintenance and repair projects costing less than \$10,000 which were excluded from the previous definition. Using trend line analysis, a projection of the expected range of the FY 1975 BMAR was \$1,000 - \$1,150 million. The expected range was between \$63 - \$214 million less than the actual FY 1975 BMAR which turns out to be a 5%- 18% difference in the actual FY 1975 BMAR.

6. The Priority of the MRP Program

The priority of maintenance and repair of real property in relation to other programs in the Marine Corps impacts on the amount of funds the Marine Corps activities request and are provided by the DCS I&L for MRP. Since funds are limited, the funds allocated to MRP by the Marine Corps must be made in relation to the other requirements, even

mission requirements. This factor is evidenced by Table 6 that shows the funds the Marine Corps identifies in its POM submission for MRP exceeds those funds identified in its budget request.

TABLE 6

COMPARISON OF THE MARINE CORPS FY 1980 POM AND BUDGET REQUEST

	<u>POM Submission</u>	<u>Budget Request</u>
	- - - - <i>millions of dollars</i> - - - - -	
Marine Corps	136.0	102.5

[Staats, 1979]

D. "CONTRACTING OUT" FOR THE MAINTENANCE AND REPAIR OF
REAL PROPERTY

Beginning with the post-Viet Nam War era circa 1972, activities within the DOD have experienced a continued decline in the number of employees [Miles, 1977]. Concomitant with the manpower reduction has been the Office of Management and Budget (OMB) policy to utilize the private sector to fill the government's needs. As a part of the OMB policy, the "in-house" maintenance and repair work being accomplished by maintenance department personnel must periodically be reevaluated by a commercial and industrial review process conforming to the criteria established by OMB Circular A-76. Given the emphasis on utilizing the private sector to fill the

government needs, a discussion of the advantages and disadvantages of utilizing a commercial contract to accomplish the maintenance and repair of real property identified by several studies is appropriate.

In order to fully understand the advantages and disadvantages of "contracting-out" the factors which influence its success are presented. The factors identified as potentially influencing the success of "contracting-out" are [Miles, 1977]:

1. Selection of a reliable contractor; ensuring the contractor's experience and record of performance measure up to the job.
2. Consideration of the scope of the services offered by the contractor versus those required by the job; ensuring the contractor is able to complete the job.
3. Placing an emphasis on job performance. If the contractor does not perform satisfactorily, the contract should permit cancellation of the services without obligation on the customer's part.
4. Defining the working relationships between the contractor and the "in-house" maintenance personnel relating to the respective areas of responsibilities.
5. Establishing an explicit contract delineating the exact duties that are to be performed by the contractor.

The existence of these factors should be accomplished to ensure the success of a commercial contract.

A myriad of studies have identified several advantages to the "contracting-out" of the maintenance and repair of real property. These studies can easily be found through a literature search on maintenance of real property through the Defense Logistics Studies Information Exchange. Only those advantages relevant to the "contracting-out" versus the "in-house" maintenance and repair decision are presented:

1. Qualified labor supply. Contract services provides for the selection of qualified craftsmen in each job classification; it tailors the manpower to the workload [Miles, 1977].
2. Contractors are unaffected by the personnel ceilings imposed on activities [Conners et al, 1964].
3. Contractors' flexibility in meeting peak workload requirements [Miles, 1977].
4. Contractors are able to perform services which are not within the "in-house" capability [Conners et al, 1964].
5. Contractor personnel do not count against the activities personnel ceiling [Conners et al, 1964].
6. Contractor services can be less costly to the government than the "in-house" services [Conners et al, 1964].
7. Contractor services can relieve the government of equipment, maintenance, and material purchasing requirements by having the contractor supply them [Miles, 1977].

Several studies reviewed revealed disadvantages to "contracting-out" of the maintenance and repair of real

property. Those disadvantages applicable to the "contracting-out" decision were [Conners et al, 1964]:

1. A fear by the activity of a strike by personnel of the contractor.
2. The lack of military control over contractor personnel.
3. A fear of default by the contractor where the activity personnel are not capable of absorbing the workload.
4. Political pressure by military personnel to retain the work "in-house."
5. The decision of expert activity personnel to opt for another position if the individual's current position is one which comes under the criteria of the commercial-industrial review.
6. There is no assurance of mission support by the contractor during a national emergency.
7. Contractor personnel are subject to union rules and regulations.
8. Contractor responsiveness to emergencies in most cases cannot match that of the in-house organization.
9. Contract administration procedures make it difficult to enforce quality work.

Although many difficulties are inherent in "contracting-out," a quote from a study by Mr. Willard F. Lipsey [Lipsey, 1979] seems applicable,

The question of whether or not to contract many of the tasks that are performed in-house is really a dead issue.

Faced with civilian personnel reductions and increasing backlogs of work, installations must simply contract the work or not do it.

Based upon this premise, the increased emphasis to accomplish the maintenance and repair through "contracting-out" demands effective and innovative management if the American taxpayers' interests are to be protected. Proper manning by experienced and knowledgeable personnel is needed to ensure that the government is getting what it paid for.

E. DISCUSSION OF THE KEY FINDINGS IDENTIFIED BY THE GOVERNMENT ACCOUNTING OFFICE REPORT ON THE DOD
BMAR

A recent survey of the services BMAR was conducted by members of the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) [Staats, 1979]. Their survey methodology of assessing the FY 77 BMAR was based upon a physical examination of randomly selected deficiencies considered representative of the aggregate at sundry activities. On the basis of the physical examination, the survey team concluded that [Staats, 1979]:

1. The trend of the services is toward increasing accuracy and reliability in the development and reporting of BMAR.
2. The services' continued efforts to inspect and develop BMAR will be reflected in more accurate reporting of BMAR in future reports.

3. The extent of non-reported valid deficiencies is substantial and has resulted in a general understatement of the FY 1977 BMAR by all the services. The Army report is more understated than that of the other services. Estimated ranges of the understatement are as follows:

Army--20% - 30%

Navy--10% - 15%

Air Force--approximately 15%

Marine Corps--10% - 15%

4. Total identification and reporting of deficiencies constituting BMAR is an unattainable goal. Limited resources available for inspecting and identifying deficiencies, occasional inaccurate cost estimating, non-reporting of minor deficiencies, and the extent of "unseen" deficiencies will perpetuate understatement of BMAR.

The DOD Real Property Maintenance Council considered the survey team's evaluation in a May 25, 1978, meeting. A report on the meeting indicated that the council considered the general perception the survey team gained from the study was sufficiently valid to apply service wide.

V. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The Marine Corps' program control system provides for an annual on-site survey and validation of each activity's real property by personnel from the Deputy Chief of Staff for Installations and Logistics' Office. Since major repair projects, those exceeding \$25,000, are numerically rated during the validation, command bias in funding the major repair projects does not occur. Not one other military service conducts an on-site validation to the extent the Marine Corps does.

However, the Marine Corps' program control system for the maintenance and repair of real property can be improved. Training of maintenance department personnel needs to be emphasized more. Not the personnel who actually perform the maintenance and repair, but the personnel who inspect, plan, estimate, and administer the program control system. These are the personnel responsible for identifying the maintenance and repair requirements, projecting the resources to satisfy the requirements, programming the resources for the requirements, and supervising the execution of the maintenance and repair of real property. Unless these personnel receive training on the most recent information on their responsibilities, the program control system cannot achieve optimum results.

The training of the activity's personnel will increase the cost of operating the maintenance department, but these costs should be off-set by the work those personnel are able to accomplish. The formal school-training should be accomplished as prescribed in the Real Property Facilities Manual, Volume III, Facilities Maintenance Management at least every three years at a Naval Facilities Engineering Command's school for the planners and estimators at each activity or upon a major revision of the guidance. In addition, training for the inspectors and the personnel who administer the maintenance and repair of real property should be conducted at least semi-annually so that they receive the most current information available on the program control system.

Furthermore, the proper staffing of the activity's maintenance department is crucial to the development of the Marine Corps program control system. The activity must ensure sufficient billets are established in the maintenance department for the personnel responsible for administering the maintenance and repair of real property. Essentially the majority of these are the billets for the inspectors, planners and estimators, programmers, contract personnel, budgeters, and shop schedulers. The proper number of billets must be determined by each individual Marine Corps activity based upon the following factors: the age and condition of the facilities, the type of the facilities, the dispersion of the facilities, and the amount of BMAR at the activity. Only if

the activity staffs the maintenance department with the number of skilled personnel necessary to accomplish the maintenance and repair of real property based upon the above factors, will the program control be as effective as possible. Proper manning by experienced and proficient personnel in the maintenance department is fundamental to the performance of the Marine Corps program control system.

This study noted several factors which influenced the continued growth of BMAR in the Marine Corps. Inflation and the increased emphasis to identify the BMAR have generated the most impact on the growth of the BMAR. This is not surprising when one considers the trend of the economy and the Congressional criticism. Moreover, the Marine Corps has little influence over these factors. A factor the Marine Corps can influence is the fiscal constraints in the budget. The Marine Corps' POM submission identifies the MRP resources required to reduce BMAR to a manageable level over the FYDP period. As long as the Marine Corps' budget reflects a similar amount of resources and those resources are expended on the maintenance and repair of real property, the BMAR can be reduced to a manageable level in accordance with the DOD guidance. But the Marine Corps' budget requests indicate that the total maintenance and repair requirements significantly exceed the actual expenditures. If these requirements are valid, the BMAR cannot be reduced under current funding levels because the new requirements annually exceed the funds available.

B. RECOMMENDATIONS

The consideration of the following concepts at the applicable activity or DCS I&L level may prove beneficial to the maintenance and repair of real property in the Marine Corps.

1. A review by each activity of the staffing of their maintenance department should be conducted to ensure that an adequate number of billets are assigned for administering the maintenance and repair of real property. The number of billets should be determined based upon the age and condition of the facilities, the type of the facilities, the dispersion of the facilities and the amount of BMAR at the activity. Essentially the review should consist of those billets for the inspectors, planners and estimators, shop schedulers, and resource and program planners. In consonance with the staffing review, the activity must provide training to ensure that the personnel assigned to these billets are knowledgeable of their duties/responsibilities. The planners and estimators should receive formal school-training at a Naval Facilities Engineering Command sponsored school at least every three years as prescribed in the Real Property Facilities Manual, Volume III, Facilities Maintenance Management or upon a major revision of the guidelines. Training for inspectors, shop schedulers, and the personnel involved in administering the program control system should be accomplished upon their hiring, upon major revision of the

guidelines, and at least four hours semi-annually. This training is to ensure that personnel are briefed on the most recent information on the program control system for the maintenance and repair of real property.

2. The DCS I&L consider requesting the DOD for authorization to refine the definition of the term "BMAR" to:

The Backlog of Maintenance and Repair (BMAR) is the cost of those maintenance and repair requirements which needed to be accomplished in a previous fiscal year but insufficient resources precluded accomplishment in that fiscal year and the requirements remain a current valid requisite. The BMAR requirements must conform to at least one of the following criteria:

- a. Be cost effective
- b. Impact on the readiness of the unit
- c. Be required by statute.

The change will provide a more stringent definition of the term and will preclude activities from using their individual interpretations.

3. The DCS I&L consider implementing a study to review increasing the use of contract services as a method to expand the maintenance and repair capability of an activity. In conjunction with this study, consideration of utilizing computer resources to mechanize the activity's program control system for the maintenance and repair of real property should be investigated.

4. The Marine Corps should budget for the amount of funds that are cited in their POM submission. By providing funding at the level of the POM, the Marine Corps can reduce its BMAR to a manageable level by the end of the Five Year

Defense Plan. This short-term investment of funds in the maintenance and repair of real property will reduce the funds expended in future years. The maintenance and repairs that are not accomplished each year become worse with time and therefore more expensive to repair in real dollars apart from any inflationary considerations.

5. This study identified several areas that could be addressed in future studies. These areas are:

- a. A study of the means to determine the proper staffing for each maintenance department based upon the age and condition of the facilities, the type of the facilities, the dispersion of the facilities, and the amount of BMAR at the activity.
- b. A study of the costs and benefits associated with increasing the activity's maintenance and repair capability through the use of "contracting-out."
- c. A study of how to effectively and efficiently utilize computer resources to mechanize the activity's program control system for the maintenance and repair of real property.

APPENDIX A
INSPECTOR'S REPORT
[Commandant of the Marine Corps, 1975]

INSPECTOR'S REPORT NAVFAC 9-11014/35 (10-68) SUPERVISOR: NAVJAGAL 3 7502 S/N-0105-002-7001										<input type="checkbox"/> DEFIS		<input type="checkbox"/> CONTROL INSPECTION	
1. PROPERTY NO.	2. PROJECT LINE ITEM	3. F. O. C. - CATEGORY CODE	4. F. O. C. - ACT	5. S. L. R. - DATE	6. S. L. R. - DATE	7. S. L. R. - DATE	8. S. L. R. - DATE	9. S. L. R. - DATE	10. S. L. R. - DATE	11. S. L. R. - DATE	12. S. L. R. - DATE		
13. DESCRIPTION AND LOCATION										14. INSPECTION TIME USED		15. SHEET NO. OF	
13. DESCRIPTION OF ITEM AND DEFICIENCY													
FOR PREPARATION OF INSPECTOR'S REPORT, CONSULT NAVFAC PUBLICATION, "INSPECTION FOR MAINTENANCE OF PUBLIC WORKS AND PUBLIC UTILITIES" NAVFAC MO-322, VOL. 1, CHAPTER 2, SECTION 6, NOVEMBER 1969													

APPENDIX B
BACKLOG OF MAINTENANCE AND REPAIR REPORT AND PROJECTS PLAN
[Commandant of the Marine Corps, 1975]

TYPE A ANNUAL INSPECTION SUMMARY - TRANSMITTAL SHEET		REPORT BNAFAC 1101A-1	
Instructions for completing form are contained on NAVFAC MD-323			
1. FROM	2. C.F.O.	3. ACTIVITY CODE	4. ACTIVITY
<p>All facilities inspected are in satisfactory condition except those listed on form NAVFAC 9-1101A/62, having uncorrected deficiencies that require correction during the current fiscal year and are not funded as of the cut-off date of the Annual Inspection Summary.</p>	CODE	<p>5. FOR PERIOD DURING</p>	<p>6. INSPECTED BY</p>
	6. TO		
DATE	BY DIRECTION	8. VIA	<p>9. CONTINUOUS <input type="checkbox"/></p> <p>10. ONE-TIME INSPECTION <input type="checkbox"/></p>
10. FACILITIES NOT INSPECTED		11. REASON	
12. FIRST DISCUSS		13. DATE	
FROM:		DATE:	
Comments		BY DIRECTION	

Activity (1)	Current Projected (2)	Less Housing Housing Other (3)	For Period Ending FY		Sheet of (5)	
			(4)			
Description (6)	Category Code (7)	Defi- ciency Code (8)	Unfunded Cost (9)	Vati- dation Rating (10)	Number of Previous Summaries (11)	Line No. (12)

Instructions for Preparing the Type A Annual Inspection Summary
(Report Symbol DN-11014-01)

1. Text Reference. See chapter 5, paragraph 5020.4.

2. Formats

a. Form NAVFAC 9-11014/62A. Type A Annual Inspection Summary-Transmittal Sheet.

b. Type A Annual Inspection Summary (Unfunded Facilities Deficiencies) (see page C1-4).

3. Preparation

a. Form NAVFAC 9-11014/62A, Transmittal Sheet. This form eliminates the need for a forwarding letter. Only one transmittal sheet from a submitting activity is required. Instructions for completing the form are as follows:

(1) Item 1

(a) From. Abbreviated title of activity.

(b) Date. Date signed.

(c) By Direction. Self-explanatory.

(2) Items 2 and 3. Leave blank.

(3) Item 4, Activity. Name of the subordinate activity when the report is prepared by the parent activity.

(4) Item 5, To. "Commandant of the Marine Corps (Code LFF)."

(5) Item 6, Via. Chain of command when the report is prepared by the subordinate activity.

(6) Item 7. Leave blank.

(7) Item 8, For Period Ending. "30 June" and current fiscal year.

(8) Items 9 Through 13. Self-explanatory.

(9) Item 14, First Endorsement. The first endorsement shall be completed by the parent command when the report is prepared by a subordinate activity. Only major activities

shall utilize this block to annotate a validation statement to be signed by the maintenance officer and dated. The statement shall read as follows:

"The undersigned confirms that the items of current deficiencies reported on Type A AIS (Unfunded Facilities Deficiencies) are essential in accordance with the criteria contained in MCO P11000.5E and that the deficiencies cannot be accomplished during the current fiscal year."

b. Type A AIS (Unfunded Facilities Deficiencies)

(1) Instructions for completing the heading blocks are as follows:

(a) Item 1, Activity. Self-explanatory.

(b) Item 2, Current Projected. Indicate which unfunded deficiencies are being reported by blanking out the inappropriate heading.

(c) Item 3, Less Housing, Housing, Other. Mark the appropriate space. When marking (other), indicate the type; e.g., Industrial Fund, etc.

(d) Item 4, For Period Ending. "30 June" and current fiscal year.

(e) Item 5, Sheet of . Self-explanatory.

(2) List the entries in columns 6 through 12 in deficiency code numerical sequence, and subtotal entries under each code. List items within each deficiency code grouping in the numerical sequence of category codes. (See item 7.) Double space between line items.

(3) Instructions for completing columns 6 through 12 are as follows:

(a) Item 6, Description. Enter the descriptive title, structure number, and other identification sufficient to relate the particular facility or group of similar facilities to the three-digit DOD code and to relate a specific cost to a specific building. (See examples of items shown in chapter 5, paragraph 5020.3.) Deficiencies of all work for similar facilities identified by the same three-digit DOD code may be consolidated and reported as a single item when the cost of the work meets the monetary criteria of the deficiency code entered in column 8.

(b) Item 7, Category Code. Enter for each line item the three-digit DOD category code identifying the facility as set forth in NAVFAC P-72.

(c) Item 8, Deficiency Code. For each item in column 6, enter the appropriate code identifying the type of deficiency as set forth in chapter 5, paragraph 5020.3.

(d) Item 9, Unfunded Cost. Enter the current unfunded estimated cost for correcting the deficiency. After the last item in each deficiency code grouping, enter the cost subtotals. Express costs in thousands and one decimal place for the nearest hundred; e.g., \$25,157 should read \$25.2.

(e) Item 10, Validation Rating. Leave blank.

(f) Item 11, Number of Previous Summaries. Enter the number of years the line item has been reported in previous summaries.

(g) Item 12, Line Number. Enter the number in sequence of each line item entry regardless of deficiency code or category code. Indicate those line item deficiencies that have environmental implications with an asterisk (*) by the line number.

c. DD Form 1391. For each current deficiency line item that exceeds \$300,000, a DD Form 1391 shall be prepared to the extent applicable in accordance with the instructions contained in MCO P11000.5. The following items are emphasized:

(1) Title. Under the title "MILITARY CONSTRUCTION LINE ITEM DATA," type "REAL PROPERTY FACILITIES PROJECT."

(2) Block/Section Heading. Record the following as appropriate:

(a) Block 14, Type of Construction. P, SP, or T to denote the type of existing structure.

(b) Block 15, Line e, Other. Maintenance or repair.

(c) Block 19, Description of Work to Be Done. Complete description of project, the work involved, and method of accomplishment.

(d) Section B, Cost Estimates. Self-explanatory.

1 Importance of the project to military readiness and capability and to the deterioration of real property.

2 Relationship of the project to other projects programmed or planned.

3 Relationship to approved mobilization requirements for projects at inactive installations.

4 Other pertinent information to demonstrate essentiality.

APPENDIX C
HQMC VALIDATION SHEET - MAJOR REPAIR PROJECTS (LESS FAMILY HOUSING)
[Commandant of the Marine Corps, 1975]

<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 200px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>
Activity	Activity Name	Yr.	Mo.	Day.

<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 100px; height: 20px;"></div>
AIS Line No.	Activity UIC

Work Description

<div style="border: 1px solid black; display: inline-block; width: 30px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 20px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 60px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 40px; height: 20px;"></div>	<div style="border: 1px solid black; display: inline-block; width: 100px; height: 20px;"></div>
Def Code	Facility No.	DOD Cat. Code	Time Reported	Previous Proj. No.	Validated Rating	Est. Cost (X\$000)

Real Property Deficiency Rating Factors

1. Command Importance

- a. High 2.0
- b. Medium 1.5
- c. Low 1.0

2. Impact on Mission (IM) or Self Amortizing Projects (SAP)

- a. High IM or 3 year SAP. 4.0
- b. Medium IM or 5 year SAP 3.0
- c. Low IM or 10 year SAP 1.5
- d. Neither IM or SAP 1.0

3. Influence on Personnel Safety, Morale, Welfare, Environment,
Energy Conservation, Security, or Damage to the Equipment
Installed to or Using the Real Property

- | | | |
|----|--------|-----|
| a. | High | 2.5 |
| b. | Medium | 2.0 |
| c. | Low | 1.0 |

4. Rate of Deterioration of the Real Property

- | | | |
|----|--------|-----|
| a. | High | 2.5 |
| b. | Medium | 2.0 |
| c. | Low | 1.0 |

5. Increased Maintenance Cost of the Real Property

- | | | |
|----|--------|-----|
| a. | High | 2.0 |
| b. | Medium | 1.5 |
| c. | Low | 1.0 |

Deficiency Rating X X X X =

HQMC Representative _____ dtd _____
(Signature)

Activity Representative _____ dtd _____
(Signature)

1. INTERPRETATION OF RATING FACTORS. Current and projected deficiencies reported as Category Code 2 will be evaluated by a numeric rating system. The rating system will be determined by selecting the most fitting numeric factor from each of the five major elements as listed in Appendix C and then multiplying these factors together. (e.g. assuming the rating in respective categories is 2.0, 3.0, 2.5, 1.0, 1.5; these ratings multiplied together produce a numeric rating equal to 22.5). The rating factors grouped by major elements are defined as follows:

a. COMMAND IMPORTANCE. Allows for the imponderables of command interest. Of the total number of line items, only 1/3 will be allowed in each category. (e.g. if the AIS lists 15 Category Code 2 deficiencies, 5 can be High Importance, 5 medium and the remainder Low)

b. IMPACT ON MISSION (IM) OR SELF AMORTIZING PROJECTS (SAP) A determination of the relative influence of the deficiency on the mission of the activity; OR: a determination of economic relief depending on self-amortization periods. The activity should be able to produce documentation supporting either case. (Amortization projects will be evaluated as per NAVFACENGCOM Economic Analysis Handbook P-442 of May 1971).

(1) HIGH (IM) OR 3 YEAR (SAP). A deficiency that, if permitted to exist, will significantly impair or prevent performance of the unit or activity's mission (e.g. extensive cracking, spalling or soft spots in a runway/taxiway, or parking apron at an aviation activity; a need for grading of firing line at a training activity; repairs required to a large portion or a complete replacement of a leaking or deteriorated building roof which houses primary mission related equipment, materials, supplies, or goods; extensive repairs required to necessary utilities which serve primary mission related facilities); OR: A project that is self-amortizing in three or less years (e.g. repair of a badly leaking steam or condensate line resulting in an offsetting energy saving). Documentation to support High SAP projects will be attached to the validation sheet.

(2) MEDIUM (IM) OR 5 YEAR (SAP). A deficiency that, if permitted to exist will to a lesser degree impair performance of the activity's primary mission (e.g. a deteriorated road, quarters, gymnasium or similar physical conditioning type facilities, vehicle or public works maintenance type facilities); OR: A project that is self-amortizing in five years or less (e.g. repair of storm windows resulting in an energy savings). Documentation to support Medium SAP projects will be attached to the validation sheet.

(3) LOW (IM OR 10 YEARS (SAP)). A deficiency that, if permitted to exist will have little impact on the primary mission (e.g. repairs to clubs, commissaries, swimming pools, bakeries, laundries); OR: A project that will amortize in 10 years or less.

(4) NO (IM) OR NO (SAP). A deficiency that, if permitted to exist will have no impact on the primary mission (e.g. interior painting, ceiling or floor tile replacement, repairs to kindergartens, child care centers, etc.) OR: A project that will amortize in more than 10 years or not at all.

c. INFLUENCE ON PERSONNEL SAFETY, MORALE, WELFARE, ENVIRONMENT, SECURITY, ENERGY CONSERVATION, OR DAMAGE TO THE EQUIPMENT INSTALLED IN OR USING THE REAL PROPERTY. The relative effect of the deficiency in any one of these areas.

(1) HIGH. The deficiency has a significant, adverse effect in one of the areas to the detriment of the command (e.g. repairs to a heating system in a cold-weather climate; repairs to the perimeter lighting system around an ammunition dump).

(2) MEDIUM. A moderate effect in one of the areas which will result in annoying but tolerable conditions. (e.g. cracking sidewalks, functional but antiquated wiring).

(3) LOW. The deficiency has little or no effect in one of the areas (e.g. exterior repairs to a storage shed).

d. RATE OF DETERIORATION OF THE REAL PROPERTY. The expected rate of deterioration of the facility if the deficiency remains uncorrected.

(1) HIGH. A high deterioration rate (e.g. leaking roof, pavement pot holes).

(2) MEDIUM. A moderate deterioration rate (e.g. exterior painting, sealcoat paving).

(3) LOW. A low deterioration rate with likelihood of little progressive damage, regardless of time delay (e.g. replacement of floor covering, rewiring of a building).

e. INCREASED MAINTENANCE COST OF THE REAL PROPERTY. The deficiency is such that continued determent may result in higher maintenance costs (e.g., deferment of repiping a building may result in repetitive maintenance work) OR: if accomplished at a particular time or under particular circumstances, may result in lower costs (e.g, resurfacing a parking lot in conjunction with resurfacing a street).

(1) HIGH. A high probability that maintenance costs or unit costs will increase by more than 25 percent without regard to routine price or wage increases.

(2) MODEST. Same criteria as contained in paragraph 5041.3e(1), preceding, except that the rate of increase ranges from 10 to 25 percent.

(3) LOW. Same criteria as contained as paragraph 5041.3e(1), preceding, except that the rate of increase is less than 10 percent.

2. COMPLETING THE TOP PORTION OF THE VALIDATION SHEET.

Much of the following information contained in the top portion of the validation sheet will be completed by the validator prior to his arrival at the activity. The remaining information will be filled out during the validation process. Respective blocks will contain the following:

a. ACTIVITY. Type of Activity: MCAS, MCB, etc. as appropriate.

b. ACTIVITY NAME. Proper Name: El Toro, Camp Lejeune, etc., as appropriate.

c. YEAR-MONTH-DAY. Date the on-site validation was made.

d. AID LINE NO. Annual Inspection Summary Line number.

e. ACTIVITY UIC. Activity Unit Identification code as listed in the current edition of MCO P1080.20D.

f. WORK DESCRIPTION. Keeping within the 31 spaces provided, describe the work to be done in as much detail as possible. Standard abbreviations as published in the current edition of MIL-STD-12C may be used. This title will be used verbatim in all future correspondence concerning this line item.

g. DEFICIENCY CODE. List the deficiency code as prescribed in paragraph 5020.3 of this order.

h. FACILITY NO. List the facility or building number as carried on the NAVFAC Real Property Inventory.

i. DOD CAT CODE. List the applicable three digit basic facility category code as contained in the current edition of NAVFAC P-72.

j. PREVIOUS PROJECT NO. List the previous HQMC assigned project number if one has been assigned.

k. VAL RATING. List the validated rating assigned during this validation.

l. EST COST. List the estimated cost in thousands of dollars.

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